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ABSTRACT

This paper describes the CEDAR Project, which is designed to encourage and facilitate the development and effective use of educational computing within Imperial College, the University of London, and elsewhere. The project supports teaching staff by providing an information service and demonstration facilities, by developing and implementing educational computer programs, and by assisting with educational development and training. References and a list of 18 publications and reports from the project are included. (Author/JEG)

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THE CEDAR PROJECT

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THE CEDAR PROJECT

1. INTRODUCTION

This is not an appropriate place to advance and develop the arguments for and against educational computing in all its aspects. Suffice it to say here that teachers are faced with many and various problems relating to their teaching and their students' learning. Highly structured courses to meet the particular needs of individual students pose problems of instruction; modular course structures with more sophisticated assessment methods pose problems of student management; student centred courses pose problems of resource management; necessary practical experience may be time consuming, expensive, or impossibly dangerous. Educational technology, in its widest sense, provides teachers with methods and tools which, properly applied, can alleviate some of these problems. The computer is one of these tools - but only one. True, it is a most powerful, and for some a charismatic tool, but its efficiency depends on its proper application.

The broad aim of the CEDAR Project is to encourage and facilitate the development and effective use of educational computing within Imperial College, the University of London, and elsewhere. The project supports teaching staff by providing an information service and demonstration facilities, by developing and implementing educational computer programs and by assisting with educational development and training.

2. STRATEGY

Previous experiences with many forms of educational innovation, including educational computing, have shown that the 'successful' innovations are those driven by the teachers themselves, rather than those imposed on them from above, by administrators or detached research and development teams. House identifies this as a major reason for the poor impact of computer assisted learning in the USA in the 1970s (House 1974). Further evidence comes from the many evaluation studies of the National Development Programme in Computer Assisted Learning (NDPCAL) projects in the UK.

Hence the Project strategy is to encourage teachers to examine the possibilities of educational computing, to recognise its contribution as a solution to some of their problems, and then to facilitate the development of appropriate educational tools. There is an important distinction here between support, which is passive, and encouragement, which is very active. Both are necessary.

3. INFORMATION

The project provides a variety of information about the milieu of educational computing, such as:

- general descriptions of computer assisted and computer managed learning,
- descriptions of specific educational computing projects,
- the implications of educational computing for curriculum design and assessment,
- technology associated with educational computing.

The enquiry service is founded on two databases kept on the main College computer, which hold details of books, reports and papers on computer based learning and related topics, and details of computer assisted learning packages available in the UK. These catalogues are published in microfiche together with a keyword in context (KWIC) index, and can be searched on-line using a computer terminal and a simple enquiry program.

The CEDAR bibliography is a collection of references to books, papers and reports on educational computing. It includes references on computer assisted and computer managed learning, simulation, student record keeping, educational and management implications and some fringe references on related topics that are considered useful. The references are drawn from the UK, North America, Europe, the Soviet Union, India and Australia.

Many of these publications are held in the CEDAR collection in the College Library, and are available on loan to members of the College and to other libraries.

The CAL Package Index is a comprehensive list of references to CAL programs available in the UK. The initial sources include most of the educational computer centres in the UK, who have supplied details of CAL programs in their libraries, a number of program exchange catalogues, and some other existing program indices. Periodically, the index is brought up to date with details of new and changed programs.

The data held on each program is not exhaustive, but should be sufficient to enable a user to see whether it is likely to be suitable for his needs. It includes a brief description of the program with the subject and the type of students for whom it was written. There are notes on the programing language and any special peripherals, eg graphics terminals, that may be used. Finally, the entry includes a contact address from whence further details may be obtained.

A full description of the enquiry service is given in the Imperial College Computer Centre bulletin 'Information on computers in education and training.' Copies of this, the CEDAR Bibliography, CAL

Package Index, and their associated KWIC indexes, are available from the Project.

4. SEMINARS

The Project arranges a series of seminars on various aspects of educational computing. Where appropriate, these may be in collaboration with the Education Forum, the Department of Computing and Control, or other departments in the College. The seminars, which are given by guest speakers from the United Kingdom and overseas, are open to all interested parties.

5. DEMONSTRATIONS

The Project supports a small demonstration facility which enables interested teachers to experience various aspects of educational computing in several subject areas. A number of different programs have been implemented to illustrate:

- tutorial style computer assisted learning,
- simulation and modelling applications,
- computer assisted management of the teaching/learning process.

An area in the Lyon Playfair Library has been set aside for demonstration purposes. This is equipped with a small graphics terminal which may be connected to the main College computer or, via a dial-up GPO telephone line, to other computer systems. Many of the demonstration programs are implemented on the College computer; those programs, developed at another institution, which are infrequently used or required at short notice, are run on the computer at that institution, from the same terminal. Moving programs from one computer system to another can be a resource consuming process which is not justified for programs that are only occasionally used.

For the demonstration to have relevance it must consist of more than an exhibition of the technology. Ideally it should involve the teacher working through a section of the course related to his (or her) own interests. This may well involve other media, eg student notes or tape slide, to complement the computer based materials. Hence the room also contains a small collection of course materials and facilities for using tape slide. Other features are display material and a selection of books and reports on educational computing.

6. SOFTWARE

The resources of the CEDAR Project are limited and hence comparatively little effort is expended in developing new software. Rather, the resources are directed towards importing existing software and the associated educational materials from other computer assisted learning projects, and adapting them as necessary to meet local needs. The management of resources is discussed in Section 9. There is, of course, a wealth of material available from the projects sponsored by NDPCAL, most of which is available free or for a minimal charge to educational irstitutions in the UK (see James 1977 and NDPCAL 1977). CEDAR is an active participant in these activities. Most computer assisted learning projects are happy to see and assist other institutions using their materials and CEDAR maintains continual contact with similar organisations in the UK and overseas.

The CEDAR Project works closely with other parts of the Computer Centre, particularly the Applications Programming Group which is responsible for CAL software development, with the Department of Computing and Control, and with other departments within the College, to investigate, develop and exploit various aspects of computer hardware and software technology relevant to educational computing. Problems highlighted by CEDAR may provide fruitful areas for research, with the Project acting as a test bed for ensuing development.

7. EDUCATIONAL DEVELOPMENT

There is a tendency in educational technology for the education to be forgotten in the delights of the technology. The teacher, however, is facing educational problems and it is undesirable that these should merely be replaced by technological ones. The technological problems of computer assisted and computer managed learning have been identified and, by and large, we now have workable, if not optimal, solutions. Much less is understood about the educational implications, the effects on the curriculum and assessment, or the most effective way of using this technology for the lecturer or teacher. Although considerable research has been done, the techniques in a useable form have not yet filtered down to the chalkface. There is a need for inservice appreciation courses, to enable teachers to recognise the possibilities and limitations of educational computing in relation to some of their problems.

This need exists, not only within the College, but also in many other educational and training institutions. CEDAR provides support in the form of personal advice from members of the College Computer Centre who have had considerable practical experience of computer based learning and can relate the techniques to a variety of learning problems. The Project can also provide short courses, lasting perhaps for two afternoon sessions, for College staff and other interested parties. It is possible that this aspect of the Project could be developed further, providing a useful service to the educational

community in general and to industry.

8. COLLABORATION

Wherever appropriate, the CEDAR Project endeavours to work with other organisations involved in educational computing, both within and outside the College. It has established and maintains contacts with computer assisted learning projects in the UK, Europe and overseas, exchanging information and expertise. Visitors from other projects are invited to give seminars which are open to all those who are interested. There are also facilities for accommodating academic visitors on sabbatical leave.

There is considerable scope for collaboration with industry, to develop new methods and expertise for management and skills training. The possibilities of inservice appreciation courses have already been noted in section 7.2. A study of the future for computer assistance in industrial training (Miles 1977) urges that there should be a centre, competent to give authoritative and impartial advice to prospective users of computer based training systems. CEDAR can provide such support for industry.

9. MANAGEMENT

As with many other educational technologies, the development of courses which use the computer as a quasi-teacher, as a manager or as a simulator, requires resources of people and facilities. These resources are limited and this adds necessity to the desirability of using them to the best effect. This section outlines the way in which the development and use of educational computing is encouraged and managed in the CEDAR Project. It is derived from a model developed at Nijmegen (Leiblum 1977).

Functionally, CEDAR is divided into three parts. The enquiry service, although based on the main College Computer, is centred on the Lyon Playfair Library which houses the CEDAR collection of books, papers and reports on CAL and related topics. The software support is provided by the Applications Programming Group in the Computer Centre. The third function, the educational development and consultancy central to the Project, is provided by members of the Computer Centre who are experienced in computer assisted and computer managed learning.

Teachers who are interested in the possibility of using the computer to support their teaching are invited to contact the Project to discuss their ideas. It is intended that these discussions should culminate in a proposal which sets out the aspirations and intended course of the development.

The development proposal discusses:

- the educational environment, the course and its students,
- the particular problems which the development seeks to solve,
- the alternative solutions considered,
- a description of the proposed development,
- the resource implications for the proposed development and its subsequent operation,
- the management of the development,
- how the work is to be evaluated to assess its cost, achievements and 'success.'

All these are standard points which should be considered for any development and the intial planning which is forced by such a document is most useful in clarifying thoughts and objectives at an early stage.

The development proposal and, in particular, its resource implications, are then considered and refined further. Since the resources available in the College are limited, it is necessary to allocate them to the greatest effect. Hence the Project looks for developments which:

- make the best and appropriate use of the technology,
- show good potential for long term educational benefit to justify the resources required.

Following its acceptance, the development proceeds with its progress monitored by the Project. This is not intended to supplant the internal management of the development which is responsible for its detailed running. The organisation of the internal management varies for each individual development, taking into consideration its size, resource requirements, personal preferences and style.

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